March 24, 2003

Sixty years ago this month, ground was broken on the first facilities for what we now know as the Hanford Site. In the site's 60-year history, Hanford workers have played a pivotal role in winning World War II and the Cold War, and have been successful in the environmental cleanup mission that has spanned more than a decade. In these pages, we celebrate Hanford's 60th anniversary with a glimpse into the past and a look at how our history has shaped the present and future.

World War II

In 1941, an atomic research group headed by physicist Glenn T. Seaborg at the University of California produced the first submicroscopic amounts of plutonium-239. After the attack on Pearl Harbor in December of that year, the Army Corps of Engineers was brought into the atomic project, and President Franklin D. Roosevelt charged the Corps with constructing industrial plants that could produce both uranium-235 and plutonium-239.

Hanford riggers (from left) Jack Haze, Bob Walker and John Vucich posed for this 1944 photo that was used on the cover of a recruiting pamphlet distributed nationwide.

A new division was formed within the Corps, called the Manhattan Engineer District, in June of 1942. In September, General Leslie Groves was named to head the new division, and two months later the DuPont Corporation signed on as prime contractor to construct and operate the plants.

The parties agreed that plutonium production should take place far from the nation's populated areas. So, a team headed by Col. Frank Matthias left in late December 1942 to scout the western United States for a remote site. After exploring the dusty tract lying between the towns of White Bluffs, Hanford and Richland, Wash., they reported to General Groves that the place was "far more favorable in virtually all respects than any other." Groves came to see for himself and ordered the acquisition of the land.

Continued on page 2.

Residents of the towns of Hanford and White Bluffs were displaced by the secret government project.

The Hanford Site celebrates 60 years of protecting America

No time was wasted. In the 30 months between groundbreaking in March 1943 and the end of the war in August 1945, Hanford Site workers built 554 buildings (not counting housing) including B, D and F reactors; T, B and U processing canyons, 64 underground waste tanks and many facilities dedicated to fuel fabrication in the 300 Area. They also built 386 miles of roadway, 158 miles of railroad tracks, 50 miles of electrical transmission lines, hundreds of miles of fencing and the "government city" of Richland, capable of housing 17,500 people.

The sign-up room of the Hanford Employment office was a busy place when it was photographed in recognition of a record number of new employees hired in a single day.

Secrecy reigned. Employees recruited throughout the country were told only that they would be working "out west" and "doing important war work."

The mission of the Manhattan Project was unveiled in national press releases on Aug. 6 and 7, 1945. The Japanese surrendered on Aug. 14, just five days after the bomb containing Hanford's plutonium was dropped on Nagasaki, and the victory celebrations in Richland were covered in the national news. Even as they celebrated the victory, Richland residents wondered about the future of atomic energy, and about whether the atomic plants would close. But the Soviet Union was racing to develop its own bomb.


J.C. Knapp, one of the first members of the Hanford Patrol, was photographed during World War II with a Japanese rifle and other war souvenirs sent to him from the Pacific Theater by his son, a Marine corporal.

The post-war period

The civilian Atomic Energy Commission, formed in 1946, took control of Hanford and the rest of the U.S. atomic complex on Jan. 1, 1947. By February, improving and expanding the plutonium production units at Hanford topped the list of AEC goals. A solemn President Truman "declared" the Cold War in a speech warning of the Soviet menace.

The AEC decided to expand the Hanford Works. The agency directed General Electric, the prime site contractor beginning in September 1946, to build two new production reactors, H and DR, along with the Plutonium Finishing Plant and 42 additional high-level waste storage tanks.

During the 1947-49 expansion, an enclave for construction workers was built in north Richland to provide temporary worker housing. By the summer of 1948, this trailer and barracks community housed about 12,000 construction workers and about 13,000 of their family members. It included a commercial district, recreational buildings and medical facilities.

Continued on page 3


A freckle-faced 10-year-old named Pat McChesney bought 40 $25 War Bonds with money he earned shining shoes. His family came to Hanford from Wapello, Iowa.

The Hanford Site celebrates 60 years of protecting America

The Cold War

As Richland and the Hanford plants grew, the Cold War worsened. In September 1949, Americans were shocked by the Soviet test of an atomic bomb. The Hanford Site experienced another major growth surge that lasted from 1950 through 1952, spurred by the Korean War and China's alliance with the Soviet Union.

Just as the Korean War expansion was reaching completion, the election of President Dwight D. Eisenhower brought an emphasis on developing nuclear rather than conventional weapons.

The Eisenhower expansion saw the construction of KE and KW reactors, the Plutonium-Uranium Extraction (PUREX) facility and 21 more single-shell waste tanks. The K reactors powered up in 1955 and brought the total number of reactors operating at Hanford to eight.

This all-black labor crew in the 200 East Area was called the "100 Percent Crew" because each one bought War Bonds. Later, they lived up to the name with 100-percent participation in the Day's Pay campaign, in which Hanford workers contributed a day's pay to buy a B-17 bomber.

Peak production years

The period from 1956 to1963 was the most intense defense production period at the Hanford Site. Tensions of the Cold War, intensified by the coming to power of Nikita Khrushchev in the Soviet Union, drove the production of special nuclear materials.

The trailer camp that housed thousands of Hanford workers was hot and dusty, and metal roofs were provided in the parking areas to reflect the hot sun. Some residents took advantage of the extra roof space to build themselves a little more living area.

In 1960, John F. Kennedy campaigned on the pledge that he would close the "missile gap" with the USSR. Policies that he initiated tripled the U.S. nuclear destructive capability by 1964. In the Cuban "missile crisis" of October 1962, he successfully challenged the Soviet attempt to place intercontinental ballistic missiles in the western hemisphere, and it was partly Hanford's weapons-production program that enabled him to stand firm.

Few new facilities were built during the peak production years, but N Reactor, a unique plant that combined plutonium production with the steam generation of commercial electric power, attracted the world's attention. N Reactor began production in December 1963 and started generating power in 1966. It was the largest electric power producer in the nation in its early years.

During this period, the volume of waste produced by the eight single-pass reactors increased sharply. A 1956 feasibility study had resulted in a voluntary decision by Hanford managers to construct no additional

Continued on page 4.

The Hanford Site celebrates 60 years of protecting America

Surveyor Marley Fitzgerald appeared in a "Question of the Week" feature in the *Sage Sentinel* on Aug. 14, 1944. Asked how he felt about the Allied invasion of Europe, he expressed confidence in Gen. Dwight Eisenhower.

single-pass reactors, but power levels at the existing reactors were raised many times, to levels nearly 10 times those of World War II. The intensive production brought thermal increases and more chemical and radionuclide burdens to the Columbia River.

In 1964, President Lyndon Johnson surprised the Hanford Site with his announcement of a decreased national need for special nuclear materials.

That same year, Battelle was named by the Atomic Energy Commission to run the Hanford Laboratories, which conducted research and development for the Hanford Site. Under the terms of the contract, Battelle funds would be invested in facilities that promoted research and development, and Battelle was granted the ability to use the laboratories for other research projects that didn't involve the Hanford Site. Construction began on four buildings that were completed in late 1967. The Hanford Laboratories became Pacific Northwest Laboratory, forerunner of today's Pacific Northwest National Laboratory, still operated by Battelle.

An idea for a saw-setting device that saved time in his job earned recognition for saw filer C.H. McElroy during Hanford's wartime construction period.

Today, the laboratory provides the research-and-development support needed for Hanford cleanup projects. The processes involved in vitrification, for example — turning hazardous waste into glass — were developed by PNNL. And, because of the broad range of scientific interests at the laboratory and its ability to pursue both government and non-government projects, PNNL has done research in a wide range of fields including space exploration, health-care, transportation, optical recording and energy efficiency.

Slowing production

In its operational years, Hanford produced about 64 metric tons of plutonium, nearly two-thirds of all the plutonium produced for government use in the United States. Now it was time for many facilities to be closed down. All eight single-pass reactors at the Hanford Site closed between 1964 and 1971, leaving only N Reactor to produce plutonium for the nation's nuclear arsenal. N Reactor began producing weapons-grade plutonium during the weapons buildup that occurred in the Ronald Reagan administration.

In 1969, the Atomic Energy Commission decided to develop the technology needed for breeder reactors, as opposed to reactors fueled by mixed oxides. Hanford was chosen as the site for the prototype Fast Flux Test Facility, and Westinghouse established the Hanford Engineering Development Laboratory for FFTF research and development. Construction began in 1970 and continued through 1978. The reactor "went critical" in February 1980, but had been left without a mission when the government's breeder reactor program was terminated. The reactor proved its capabilities through a decade of operations, but was placed on standby in 1993.

Continued on page 5.

The Hanford Site celebrates 60 years of protecting America

The era of cleanup

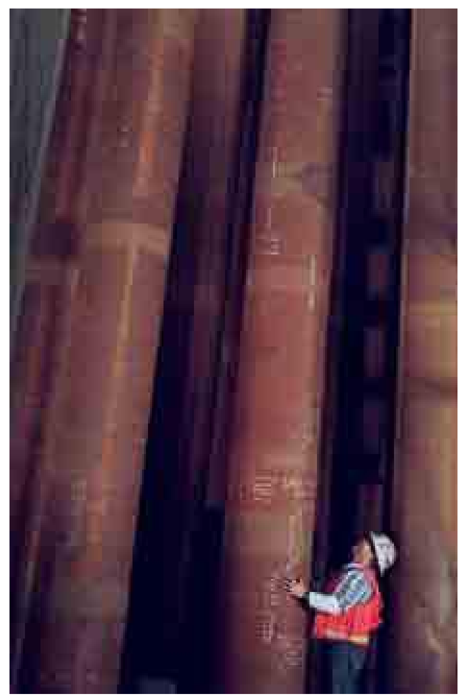
By the mid-1980s, nuclear armament agreements had greatly reduced the need for plutonium, and when the Chernobyl nuclear accident in the Soviet Union stunned the world in April 1986, concerns were raised about the perceived design similarities of N Reactor. The Department of Energy decided to close the reactor, and it was defueled in 1989. The PUREX plant was placed on standby status in 1990.

Signing the original Tri-Party Agreement in May of 1989 are Mike Lawrence (left) for the Department of Energy, Robie Russell for the Environmental Protection Agency and Christine Gregoire for the Washington State Department of Ecology.

While it took nearly 50 years to win the Cold War, the "war" to clean up the legacy of contamination on the Hanford Site is being won much more quickly. Although cleanup work was being done earlier, the environmental-restoration mission began in earnest when the Tri-Party Agreement was signed in 1989 by representatives of DOE, the U.S. Environmental Protection Agency and the Washington State Department of Ecology. The agreement included a detailed 30-year cleanup schedule, as well as mechanisms for amending and modifying the agreement.

In a1996 cleanup operation at the Plutonium-Uranium Extraction (PUREX) facility, nuclear process operator Mike Bryant scrapes plutonium residues from a processing glovebox. From 1956 to 1989, PUREX was a workhorse of the nation's nuclear arsenal, producing two-thirds of the U.S. plutonium inventory. The plant was safely deactivated in 1997.

In shifting Hanford's mission from defense production to cleanup of the legacy waste, the challenges were daunting — more than 50 million gallons of radioactive waste in 177 aging underground tanks, 67 of which were known or suspected to have leaked; 2,100 metric tons of spent nuclear fuel in basins near the river; nearly 270 billion gallons of contaminated groundwater spread out over 80 square miles; more than 1,900 stainless-steel capsules of radioactive cesium and strontium containing about 37 percent of the site's total radioactivity; more than 790,000 cubic meters of solid waste; more than 1,700 identified waste sites and 500 contaminated facilities; and about 4 metric tons of plutonium.



On April 8, 1999, the final storage tube is put into place in the Canister Storage Building vault. Spent Nuclear Fuel Project tasks are geared toward dry, interim storage of spent fuel in the Canister Storage Building.

The risks associated with Hanford's waste tanks were not well known at the time the TPA was signed, but a high priority was placed on protecting the river. In 1998, Congress created the Office of River Protection for that sole purpose,

Continued on page 6.

The Hanford Site celebrates 60 years of protecting America

and today most of the waste in the older leak-prone single-shell tanks has been pumped into safer double-shell tanks by contractor CH2M HILL Hanford Group. The Waste Treatment Plant, being built by a Bechtel team, will eventually glassify the waste for long-term safe storage.

In an historic moment, literally the result of years of preparation, the first spent nuclear fuel is moved out of K West Basin on Dec. 7, 2000.

A major part of the cleanup mission has been deactivating the former processing and production plants and maintaining them in a safe, low-cost shutdown mode. PUREX deactivation was expected to take five years and cost $225 million. Instead, the job was completed 16 months ahead of schedule for about $78 million less.

B Plant, a fuel-processing plant built during World War II, presented another complex deactivation challenge. The job involved cleaning out a huge process "canyon," installing a new ventilation system and remotely cleaning out the processing cells and miles of piping. Still, it was completed four years ahead of schedule in 1998.

To safeguard the river, most of the liquid waste has been moved from Hanford's 149 older single-shell tanks to more durable double-shell tanks. The DOE Office of River Protection and contractor CH2M HILL Hanford Group are now focused on retrieving the remaining waste for treatment and closing Hanford tanks.

During the production years, Hanford's end product, suitable for use in a nuclear warhead, was produced at the Plutonium Finishing Plant. When PFP production was stopped in 1989, 4.3 metric tons of plutonium in almost 18 metric tons of plutonium-bearing materials were left inside the facility — all needing to be converted to a form more suitable for long-term storage. Today, the Special Nuclear Material Project, managed by Fluor Hanford, has finished stabilizing some plutonium forms, is way ahead of schedule on others, and is making plans to accelerate deactivation of the 61 structures in the PFP compound.

Waste Encapsulation and Storage Facility personnel remove a manipulator from one of the hot cells that were used to fabricate radioactive strontium and cesium capsules.

The Waste Management Project, also managed by Fluor, has responsibility for treating and disposing of mixed low-level waste and packaging and shipping transuranic waste off the site — work that is proceeding well ahead of schedule.

The Environmental Restoration Project, managed by Bechtel, has removed millions of tons of

Continued on page 7.

contaminated soil and debris from along the river and placed it into a huge lined trench called the Environmental Restoration Disposal Facility. It has also “cocooned” two of the nine former production reactors.

Making progress

Today, Hanford’s mission includes risk reduction, environmental protection and cleanup. After more than a decade of progress in its environmental mission, DOE and its contractors have made the important transition from simply managing the risks to actually reducing them and forging ahead on the cleanup efforts.

WTP skilled craft workers place concrete for a perimeter basement wall of the Low-Activity Waste vitrification facility in October 2002.

These are the significant accomplishments that have been made during that decade: resolving major safety issues associated with the underground radioactive waste tanks and enabling all Hanford tanks to be removed from a congressional “watch list”; removing all the pumpable liquids from 131 of the 149 single-shell tanks; deactivating two massive chemical processing plants; moving more than half of Hanford’s spent nuclear fuel out of underwater pools near the Columbia River to safe, dry storage in the center of the Hanford Site; stabilizing and packaging all of Hanford’s plutonium solutions and half of its plutonium residues for eventual shipment off the Hanford site for disposal; actively dealing with contaminated groundwater plumes; dismantling reactor complexes and cocooning two reactor cores for interim safe storage (three others are well under way); moving about four million tons of contaminated materials (about 40 percent) away from the Columbia River shoreline; and sending hundreds of drums of transuranic waste to the Waste Isolation Pilot Plant in New Mexico for permanent disposal.

By the end of 2002, DR Reactor became the second of Hanford’s nine surplus reactors to be “cocooned” by the Bechtel-led Environmental Restoration Contractor team. Cocooning, one of the more visible signs of cleanup progress, places the old reactors in a safe-storage condition for up to 75 years.

Accelerating the cleanup

A plan to accelerate the cleanup holds the promise of a clean Hanford Site by 2035. To accomplish this, DOE is pursuing six “strategic initiatives.” The first involves speeding the cleanup of the Columbia River corridor by 20 years; the second would accelerate tank-waste treatment by 20 years at a tremendously reduced cost; the third would stabilize and “de-inventory” Hanford’s special nuclear materials much faster than previously planned; the fourth deals with accelerated disposal of waste; the fifth initiative would save time and money in cleanup up the central plateau area of the site; and the final initiative calls for accelerated cleanup and protection of the groundwater.

Continued on page 8.

The Hanford Site celebrates 60 years of protecting America

It is the largest waste-cleanup effort ever undertaken in human history. That, in itself, makes our work today historic and unique. And, just as there was no precedent for the wartime effort that led to the world's first atomic explosion and the nuclear bomb that ended World War II, there are no parallels for what we are doing today.

We are truly pioneers in our vital mission, like our wartime predecessors of 60 years ago.✪

Plutonium Finishing Plant lead nuclear chemical operator Kathy Turner works at a glovebox where plutonium-bearing polycubes are being thermally stabilized.